

ANTERIOR KNEE PAIN REHABILITATION PROGRAM

Phase I-Acute Goals:

1. To obtain baseline values. (isokinetic testing, x-rays, pain scale, Cincinnati scale, ROM, and circumferential measurements.)
2. To decrease pain, swelling, and atrophy.
3. To increase range of motion (within functional limits)
4. To initiate a home exercise program.
5. To educate on taping techniques.

PHASE I PROGRAM:

**** AVOID KNEE HYPERFLEXION AND HYPEREXTENSION
WITH ANY ACTIVITY ****

**** FOR ALL CLOSED CHAIN KNEE FLEXION EXERCISES, DO NOT ALLOW
THE ANTERIOR ASPECT OF THE KNEE TO PASS THE TOES ****

- Initiate home exercise program.
- Patella taping is optional for workouts.
- Biofeedback may be used to enhance performance
- Myofascial release-to lower extremity musculature.
- Manual stretching:
 - Thomas test position for quadriceps and hip flexors.
 - Side lying ITB.
 - Supine hamstring.
- Straight leg raises-start with body weight and add light extrinsic weight accordingly.
- BAPS-in sitting.
- Warm up activity-for ten minutes. (when using the stationary bicycle avoid a low seat; with the treadmill avoid any incline - to protect the patello-femoral joint).
- Marching in place-begin in sitting and progress to standing.
- Quadriceps isometrics-at various degrees of knee flexion.
- Proprioceptive training: static stabilizing techniques-at various degrees of knee flexion utilizing a therapeutic ball. Begin in supine with the legs on the ball, and then progress to sitting on the ball (90°-0°).
- Leg press-begin using bilateral lower limbs with a ball in-between the knees (60°-0°). Begin with low extrinsic weight (10-50% of the patient's body weight) and progress if the patient demonstrates good quad control during terminal knee extension. The patient at this time may begin unilateral leg press (10-30% maximum of body weight).
- Bilateral standing, modified knee bends (0°-60°)-begin with body weight with a ball in-between the knees and add light extrinsic weight accordingly.

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- Multi hip-to bilateral lower extremities. Be sure weight is applied proximal to the knee (flexion, extension, abduction, adduction, terminal knee extension).
- Retro walking-begin with body weight and progress to pulling a weighted sled. Increase the load as tolerated.
- Standing leg curl-begin in standing with no added weight. The patient must demonstrate easy effort prior to adding weight.
- Foot/ankle strengthening-ankle strengthening for all planes with Theraband (alphabets), towel scoots, picking up objects with the toes, heel raises. With the heel raises, begin with bilateral lower limbs then progress to unilateral.
- Balance activities-begin with bilateral stance activities and progress to unilateral on the ground. Progress to bilateral activities on the balance disc, then unilateral. Eventually incorporate multi task activities, i.e.
- performing biceps curls with a ball toss, while balancing on the disc.
- Terminal knee extension with external hip rotation-active knee extension with the hip externally rotated 5°. Restrict the motion to 15°-20° of knee flexion.
- Modalities-to decrease pain, effusion (E-stim, ice, etc...)
- Swimming-the patient may perform sidestroke or flutter kick initiating motion from the hip.

CRITERIA FOR PROGRESSION:

1. A decrease in pain on the visual analog scale by 30-40%
2. The patient is able to hold a unilateral modified knee bend at 45° for 10 seconds, unsupported.
3. The patient demonstrates proper gait mechanics.

Phase II-Intermediate/Strengthening StageGoals:

1. To increase strength and endurance for all lower limb and hip musculature.
2. To enhance proprioception.
3. To initiate functional activities.

PHASE II PROGRAM:

- Supine knee to chest-while maintaining proper pelvic stability, flex the hips and knees to 90° Place a ball in-between the knees and slowly extend the hips and knees. Then return to the starting position. Keep the heels close to the table.
- Step ups-begin with body weight then add extrinsic weights and increase step height, gradually. Discontinue if the patient has any complaints of pain.
- Step downs-with both feet securely positioned on a stationary step, lower one foot forward toward the ground while the stance limb is positioned to NOT allow the anterior aspect of the knee past the toes. Begin by tapping the toes and progress to tapping the heels. Then progress to posterior and lateral step-downs.

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- Posterior lunges (0°-60°max)-begin with the involved limb as the lead leg.
- Cable column-should be performed once the patient is able to straight leg raise with resistance distal to the knee with good quad control and without pain.
- Begin with flexion and extension followed by abduction and adduction.
- Unilateral modified knee bends (0°-45°)-stand erect. Extend hip and flex the knee and place the dorsum of the foot on a bench or box behind you.
- With support to the upper limb, lower the torso, allowing your stance knee to flex to 45°. ****DO NOT ALLOW THE ANTERIOR ASPECT OF THE KNEE TO PASS THE TOES**** Begin with body weight and progress by adding light extrinsic weight.
- Advanced hamstring activity-with the trunk flexed, perform hip extension with the upper extremity supported. With the hip extended to midrange,
- perform a hamstring curl... in the supine position perform bridging on Theraball with hip flexion, and relaxed knee dead lifts if there is no history of low back disability.
- Lateral activities-begin by increasing speed while performing lateral stepping, progress to lateral shuffles, ski simulator, modified slide board activities (side lunges, restricted distance slide board) to full range slide board.
- Cable column multi joint activities-once the patient exhibits good control with single plane motion, progress to multi joint motion. This includes simulated running, simulated skating (utilizing 2 cable columns) and soccer kicks. The latter involves multi-segment hip flexion/adduction/external rotation with knee extension.
- Cross over stepping-progress to carioca as tolerated.
- Lunges-initiate anterior, anterior-lateral and lateral lunges. Start with body weight and add extrinsic weight, then Sport Cord. Be sure to not allow the anterior aspect of the knee to pass the toes.
- Plyometrics - begin with mini jumps on the leg press at approximately 30% of body weight.
- Balance activity-multi task activities, i.e. ball toss with unilateral knee bend.

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CRITERIA FOR PROGRESSION:

1. Minimal intermittent pain-no pain limiting performance for most (80%) of activities of this phase.

Phase III- Functional Activities Phase Goals:

1. To maximize skill (i.e. force production, absorption, balance, and coordination.)
2. To initiate sport specific activity.
3. To master functional tasks of desired physical activities.

PHASE III PROGRAM:

- Continue as above.
- Lateral shuffles weighted, “stop and go”.
- Slide board with patient wearing a weighted vest or holding a dumbbell and incorporating a ball toss.
- Begin dynamic skill progression-(jumping, hopping, and leaping).
- Agility drills-
- May initiate light jogging program if the patient demonstrates good force production (i.e. jumping) and force absorption (i.e. landing), especially when leaping from uninvolved to the involved limb. Then progress to running.

RETURN TO SPORT

The outlined time frames are goals for achievement. Each patient should be considered as an individual. Activity may be progressed sooner if the previous week’s goals have been achieved.